

Giving a Voice to the Poor: Rural Telephones and Economic Development in Peru

by

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Bachelor of Science in Systems Engineering (2004)
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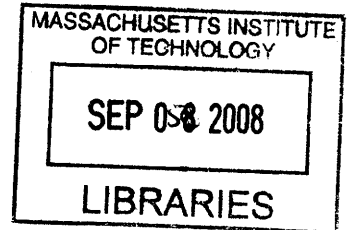
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ABSTRACT

Although the current literature on technology and development has mainly focused on the Internet, I focus on a case where an “old” technology can be more beneficial and appropriate. In 1993, the Peruvian Government created the Telecommunications Investment Fund – FITEL, a fund aimed at providing subsidies to the private sector so that they would provide telecommunication services to remote and poor communities. FITEL’s rural public telephone projects have had tremendous impacts on isolated and poor rural communities, providing an increase in welfare. The FITEL model has been replicated in many countries around the world as it has been considered successful by the literature and the development organizations. However, FITEL has also have drawn much criticism due to many problems that were unforeseen at the design phase of the projects. In this thesis we analyze how the political environment, the institutional arrangements, and the different actors affected the outcomes of the projects, providing some lessons to policy makers, especially those working on developing projects involving technology.

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Acronyms

3G – Móbile technology

CDMA – Code Division Multiple Access

CPT – Peruvian Telephone Company (Compañía de Teléfonos Limitada)

ENTEL – Peruvian Telecommunications and Telegraph Company (Empresa de Telégrafos y Telecomunicaciones del Peru S.A.)

FDI – Foreign Direct Investment

ICT – Information and Communication Technology

IT – Information Technology

ITU – International Communication Union

FITEL – Telecommunications Investment Fund (Fondo de Inversión en Telecomunicaciones)

INEI – National Institute of Statistics and Informatics (Instituto Nacional de Estadística e Informática)

MTC – Ministry of Transportation and Communications (Ministerio de Transportes y Comunicaciones)

MEF – Ministry of Economics and Finance (Ministerio de Economía y Finanzas)

MARRTS – Multi Access Rural Radio Telephone System

OBA – Output Based Aid

OI – Investment Office of the MEF (Oficina de Inversiones del Ministerio de Economía y Finanzas)

OIP – Public Investment Office of the MTC (Oficina de Inversión Pública del Ministerio de Transportes y Comunicaciones)

OPC – Communications Projects Office of the MTC (Oficina de Proyectos de Comunicaciones del Ministerio de Transportes y Comunicaciones)

OSIPTEL – Telecommunications Investment Supervising Organism (Organismo Supervisor de Inversion en Telecomunicaciones)

PDA – Personal Digital Assistant

ProInversión – Peruvian Entity of Private Investment Promotion

PPP – Public-Private Partnership

PPR – Program of Rural Projects (Programa de Proyectos Rurales)

REGULATEL – Fórum of Latin American Telecommunications Regulators

SNIP – National Public Investment System (Sistema Nacional de Inversión Pública)

Telecom – Telecommunications

Telefónica – Spanish Telecommunications Company

UNICEF – The United Nations Children’s Fund

VoIP – Voice over Internet Protocol

VSAT – Very Small Aperture Terminal

1. Introduction

When reviewing the literature on developing programs and projects that involve technology as a key element, I was struck by how much emphasis Internet and mobile phones have received in the last decade. In the literature, Information and Communication Technology (ICT) is synonymous to the Internet, personal computers (PCs), and mobile technologies, generally mobile phones. Author's have generally dismissed radios, traditional telephones (home lines and public phones), and televisions as low-level technologies from the past.

After the hype that occurred in the late 90s' over the possible benefits and solutions that ICTs could bring to the developing world, the development community took a more sober and cautious view. ICTs were no longer seen as a silver bullet against the perennials development problems but rather as a means to achieving other development goals such as education, health care, communication, and employment generation.

Most development organizations, governments, and NGO's have incorporated the view that old technologies can and should be leapfrogged by "new" ICTs into their discourse. In a recent talk given by Peru's Vice-president for Communications, the idea that poor and remote communities need the Internet rather than public phones was also central:

"We are in the 21st Century, we should give [poor and remote] communities 21st Century technology. Communities are no longer requesting telephones, they are requesting Internet, which benefits are greater" ¹

¹ Opening speech given at the presentation of FITEL's Isolated Communities Internet Project (BALA) on July 2nd, 2008 at the Swiss Hotel in Lima

Implicit in the Vice-minister's statement is the fact that poor and remote communities in Peru need "new" technology, such as Internet, vis-à-vis the "old" technology, such as public phones. The idea she conveyed during the talk, although not expressed explicitly, was that rural communities need Internet services more than phones. As we shall see in thesis, the assumption that the newest and best technologies should be offered to the poor in developing countries as a way to help them climb the development ladder should be challenged since in certain cases providing an older technology could provide far greater benefits. I am not convinced that older technologies, such as public phones, radios, or televisions, are outdated and provide fewer benefits than newer technologies, such as the Internet or advanced mobile technologies, or that these older technologies should be leapfrogged in favor of the newer ones. This is why I decided to analyze rural public telephone projects in this thesis. Even though I acknowledge the need for technologies like the Internet or mobile phones with advanced multimedia features, I find that there is a gap in the current literature regarding the potential of traditional technologies and the benefits that are occurring in many developing countries, and a bias towards taking the "latest" and "most advanced" technologies to the poor in developing countries. I believe that this bias can make decision makers overlook more appropriate technologies for many developing countries, especially the rural poor.

The Peruvian Telecommunications Investment Fund (FITEL)

In 1993, the Peruvian government created a Telecommunications Investment Fund (FITEL) to serve as a universal access provision fund. This fund was modeled after Chile's SUBTEL, but included several modifications like the payment method to be employed and the financial source

of funding. While SUBTEL employed coin-slot payphones and financed its projects with money from the public treasury, virtually all of the Peruvian phones used pre-paid phone cards and charged a 1% tax on the telecommunications firms' revenues in order to fund FITELE, which would exclusively finance rural telecommunication projects. FITELE would provide this money as a set of subsidies to the private sector, which had found that investments in most rural areas of Peru were unprofitable. These subsidies would serve as incentives by making the private company's projects profitable or at least make them not lose money.

When determining the communities that would be targeted, FITELE's first challenge was to define the selection criteria that would help filter the thousands of isolated and poor communities that would benefit from telephone services. FITELE's defined "rural communities" and "locations of preferred social interest" as:

- Communities with up to 3,000 inhabitants
- Communities with less than 100 contiguous homes or more than 100 dispersed homes.
- All capitals of districts that complied with the previous two conditions, in spite of being urban according to the INEI, were automatically considered as candidate communities for FITELE projects

FITELE was in charge of designing, bidding, granting, and supervising the projects. Once the private telecom company won the bid, it was in charge of acquiring, installing, operating, and maintaining the equipment, as well as finding a local administrator who would serve as the local concessionary for the public phone. This local administrator would provide a place in his home or store where the phone would be placed and the satellite, solar panels, batteries, and other equipment would be located in his back yard. In most cases the local administrator would also be

expected to stock pre-paid phone cards for the community to buy and train them in how to use the public phone or the pre-paid phone cards. In retribution for his responsibilities, the local administrator would receive a discount on the price of the pre-paid phone cards² (about 8%) and be allowed to charge a moderate rate (about 35 cents of a US dollar) when they would locate a person and inform them that they would be receiving a call at a certain hour or passing on a message to them. Some ingenious local administrators found ways to capitalize on the phone service that was provided in their homes by selling sodas or snacks or improving ways in which they informed the local community members that they were being called. For example, some local administrators bought and installed a megaphone and placed it on their home's roof in order to announce the name of the person that was being called and not have to walk around looking for him.

FITEL would supervise and monitor the private company's performance in order to ensure that the contract's requirements would be met. Twice a year FITEL would evaluate the public telephone service in a sample of rural communities and, if the private company met the minimum requirements, it would disburse the subsidy.

Overall Problems

The FITEL projects were not free of problems. Along the years, FITEL has made many mistakes such as designing their RPT projects with little or no consideration of rural realities, not establishing in the contract the community's training as an obligation for the private company, and most importantly underestimating the role of, to my opinion, the most important actor in the RPT model: the local administrator. Despite its mistakes, FITEL has learned from them and has incorporated into its recent projects elements that would eliminate or at least mitigate the

² There were phone cards worth 3, 5, and 10 soles, which is about \$1.2, \$1.8, and \$3.6 at current exchange rates

problems preset in the RPT projects. This is an interesting case of institutional learning that was driven by the mistakes that caused FITELE much criticism from inside the government and a lower level of phone use by the local community members.

We will analyze the most common problems and describe how these were introduced during the projects' design and we will explain why the problems were unforeseen and not eliminated. As we will see, most problems were due to a lack of understanding of rural communities by FITELE employees and many of these problems could have not been resolved without introducing other problems or elevating the costs of the projects to a point where they would not be feasible.

The Benefits

The literature states that Information and Communication Technologies (ICTs) can help the poor by allowing them to access markets, gain information that will help them improve their productive decisions, reduce transaction costs, access other public services such as health and education, foster their social relations, gain political participation, access new jobs and income generating opportunities, and, in general, increase their welfare (Rahman, 2007; World Bank, 2006; United Nations, 2006; Kane, 2003). Even though I was trained as a systems engineer as an undergraduate and my main area of study was on ICTs, I was skeptical of the promises of ICTs for stimulating economic development because of the level of underdevelopment that I had seen in many parts of Peru. I thought that poor people needed water and sanitation services, or health services, or education more than they needed ICTs. Since many of the poorest people in Peru and the world could not read or did not have the means to obtain food, I was doubtful of the possible benefits that ICTs could bring to them.

The White Tower Decision Maker: A Top-Down Approach

The government officials in charge of designing the FTEL projects were without a doubt some of Peru's most qualified public professionals. Most of the initial employees of FTEL were engineers who were experts in telecommunications technologies or economists that understood the intricacies of the financial aspects of projects. This expertise allowed the organization to be on par with the private sector companies and elaborate projects that would maximize the governments' benefits and not fall prey to the private sector due to an unbalance of knowledge. The organization where FTEL was based was also very technical, respected and serious.

In spite of the high levels of professionalism and expertise, and the superior organizational environment, FTEL employees lacked an understanding of the local culture, context, economics, and overall lifestyle. As we will see, even though the projects were very technical and the professionals designing them highly qualified and skillful, the FTEL rural public telephone projects lacked contextualization, which undermined their design and subsequent implementation.

Fierce Competition

FTEL encountered many unexpected problems and obstacles. From bureaucratic barriers and inefficiencies to personal "attacks" from envious public officials, FTEL had to jump many hurdles in order to get its projects approved and implemented. While this is common in government affairs in general and in developing countries' projects in particular, what was striking to FTEL officials was how many different unexpected events prevented their projects from advancing and becoming a reality. One of the most frustrating instances for FTEL officials

was definitely the opposition it received from inside the government. In 2004, The Ministry of Transportation and Communications (MTC) created its own Office of Communication Projects (OPC) with functions and objectives virtually identical to those of FITELE. The MTC created its own implementing office because it realized that FITELE was receiving much attention in a sector that was greatly the MTC's responsibility. Given FITELE's prestige among government agencies and its highly technical work, the Vice minister of Communications attempted to do the same type of projects in an effort to obtain recognition. The main difference was that FITELE had accumulated a great amount of money through the 1% revenue tax it charged the private telecom companies while the OPC had no available funds (it had to apply for money from the public treasury as did all the other ministries and public entities). Additionally, FITELE's projects did not have to comply with the National Public Investment System's (SNIP) requirements, which were a part of the Ministry of Economics and Finance (MEF) because its funds were not considered as part of the public treasury, granting FITELE discretion over the money that had been accumulating in the fund. Before the OPC was created, the MTC approved FITELE's projects without much trouble, but after the creation of the OPC, the MTC would direct the FITELE projects in need of approval to the OPC, who would make many observations and delay the approval. As a former general manager of FITELE said to me in an interview, the OPC had explicit orders to not approve any of FITELE's projects. Furthermore, the OPC would copy FITELE's projects and then seek funding from the public treasury through the SNIP. This adverse institutional arrangement impeded that many of FITELE's projects be approved in a timely manner, adversely affecting the rural communities who needed the help.

Mixed Outcomes

The outcomes of the FITELE projects have varied greatly. There are communities that present high levels of telephone traffic as well as communities that present no traffic in periods of two to three months. Certain communities have strong and healthy relationships with their local administrator while others practically do not use the public phone because of the animosity between the two parties. In some communities the local administrator is very committed to offering the best service possible and has improved the conditions of the public telephone with his own money by installing a phone booth to provide privacy to customers, installed light bulbs, and installed a megaphone in order to inform community members when they are being called. This difference between how well the local administrator got along with the local community can probably be explained by a myriad of factors including the local administrator's personality and how he handled the newly acquired status and monopolistic power, the prior relationship between both parties, the level of benefits derived from the service to both parties, and the local administrator's response to the community's complaints. This thesis will examine the different outcomes and try to provide explanations on how these outcomes occurred.

Chapter Descriptions

My intention in this thesis is to show how and why FITELE projects, specifically the rural public telephone projects, were designed, implemented, and monitored in the way they were in the rural communities. In the first chapter, I will provide a brief history of the telecommunications industry in Peru, define universal access and universal service, and explain how different countries around the world, specially in Latin America, have sought to achieve these objectives. All this will set the stage for understanding and explaining the need and role of

FITEL, which will be explained in the second chapter. In the third chapter, I will describe main findings related to the RPT projects and the communities that received a public phone. I will talk about how the RPT projects encountered many unforeseen obstacles from different fronts. I will also provide some examples of variation in the RPT projects implementation and outcomes across communities of Peru. Finally, in my last chapter, I summarize findings and conclude.

The Research Questions

When conducting the research and in writing this thesis, I was trying to answer two main questions:

1. *Why were the outcomes in certain communities better than in other communities?*
2. *What were the exogenous and endogenous factors that affected FITEL's RPT projects?*

The Surprises and Puzzles

When I began researching FITEL a year and a half ago, I never expected to encounter so many puzzles and surprises. For example, some of the questions I made myself were:

- Why did the projects forget to consider the local administrator?
- Why did a battle for power and recognition halt many of FITEL's projects and how did this battle start and finish?
- How were certain rural communities chosen over thousands of possible communities?
- Why were pre-paid public telephones put in place despite the communities' desire for coin slot public telephones?
- Why were the private companies not required to train the communities on how to use the public phone and the pre-paid phone cards?

Questions like these puzzled me and motivated me to continue interviewing people and seeking answers.

Methodology

I had a total of 36 interviews for this research in which two were actors from research institutions and universities, seven from local communities, two from NGOs, five from central and local governments, one local educator, six local entrepreneurs, eight FITELE officials, three OSIPTEL officials, and two private consulting firm experts (See Table 1). Additionally, I visited 17 of the 6,056 rural communities (0.28% of all communities) that were part of FITELE's RPT projects as well as 3 other communities that were not part of the FITELE projects but where local entrepreneurs on their own had developed public phones and Internet cafés. This local development had occurred in places that were more developed than the FITELE community, especially in rural places that served as commercial hubs and were becoming more urban. Finally, I thoroughly went through the documentation from all organizations involved in the projects. The combination of official interviews, community visits, and documentation analysis allowed me to understand not only FITELE as an organization, but also the context in which it operated.

Table 1: People Interviewed

People Interviewed	
Patricia Diaz	Former FITEI General Manager
Luis Alberto Bonifaz	Former FITEI General Manager, Current Apoyo Consulting Manager
Jesus Guillen	Former FITEI General Manager
Milton Von Hesse	Former FITEI Rural Telephone Projects Coordinator
Jorge Bossio	Former FITEI Analyst, Current Osiptel employee
Jorge Mesía	FITEI Engineer
Aldo Laderas	FITEI Engineer
Aldo Castro	Rural Telecom General Manager
Peter Wolf	Rural Telecom
Arieh Rohrstock	Gilat to Home General Manager
Dante Villafuerte	Independent Consultant, OSIPTTEL/FITEI consultant
Jose Juan Haro	Business Director for Telefonica
Erick Luna	Telefonica Analyst
Christian Livia	Sales Chief of Rural Telephony for Telefonica
Francisco Leiva	Alternat Consultant, Former Subtel Engineer/Manager
Jesus Gonza	Cuanto
Juan Fernando Bossio	CEPES Consultant
Hector Salvador	CEPES Director
Blas Lopez Rodriguez	Macusani Municipality Employee
Luis Albino	Director of Macusani School Unit
Christian Chee	Gilat to Home Operations Manager
Efrain Yauri	Former Telefonica Employee
Vidal Inojosa	Lampa Local Administrator
Edwin Ricse Flores	Lampa Community member
Vilma Torres	Lampa Community member
Ruben Napa	La Huaca Local Administrator
Moises Lopez Espinoza	Cuyo Agriculturer
Alberto Buitron	Hauyan Local Administrator
Jorge	Viñac Local Administrator
Luis Camacho	Rural Telephony Group EHAS
David Chavez	Rural Telephony Group EHAS
Juan Carlos Cueva	Telecommunications Engineer, Former Mobile Operator Manager
Alan Tapia Medina	Former Satellite Installer and Maintenance Technician/Engineer
Carlos Centeno	Rural Electrification Expert
Richard Webb	Instituto del Peru Director

Table 2: Rural Communities Visited for Research

Rural Communities Visited for Research		
District	Project	Province
Lampa	FITEL	Huancayo
Pariahuanca	FITEL	Huancayo
Ayaviri	Private Internet and Phone Booths	Puno
Macusani	FITEL	Puno
Puno Rural Community 1	FITEL	Puno
Puno Rural Community 2	Private Internet and Phone Booths	Puno
Puno Rural Community 3	FITEL	Puno
La Huaca	FITEL	Huaral
Hauyan	FITEL	Huaral
Cuyo	FITEL	Huaral
Palpa	FITEL	Huaral
Retes	FITEL	Huaral
Caqui o Esperanza?	FITEL	Huaral
Viñac	FITEL	Yauyos
San Jeronimo	FITEL	Yauyos
La Florida	FITEL	Yauyos
Yauyos Rural Community 1	Telefonica	Yauyos
San Jeronimo	FITEL	Lima
Asia	FITEL	Lima
Cañete Rural Community 1	FITEL	Lima

2. Background and Some Context

2.1.A Brief History of the Peruvian Telecommunications Industry

The first telephone service providers in Peru were small private companies. In 1920 a private company, La Compañía Peruana de Teléfonos Limitada (CPT), began its operations providing local and long distance telephone services in Lima, and was later bought by the Peruvian government along with the other private companies. The nationalization process began at the end of the 1960s when the Peruvian government defined a national telecom monopoly, following what the theory on natural monopolies³ said and joining what most other nations around the world were doing (Bilderbeck, Jaffe, and Sandvig, 1999). In 1969, the Empresa de Telégrafos y Telecomunicaciones del Perú S.A. (ENTEL) began its operations offering domestic and international long distance telephone service to all of Peru, as well as local phone service to all of Peru except Lima, which was serviced by CPT. These two state-owned companies, CPT and ENTEL, constituted a national monopoly with CPT providing local phone service to Peru's capital, Lima, while ENTEL provided local phone service to the rest of the country as well as providing national and international long distance call services to all of the country.

Inefficiencies in the Peruvian telecom industry were blatant in the 1990s. It could take up to five years and cost around US\$ 2500 to obtain a home phone line. The telephone fees

³ There are certain industries in the economy that are considered as natural monopolies, which are situations where a single firm is desired because the production of the particular good or service by a single firm minimizes cost (Viscusi, Harrington, and Vernon, 2005). Least-cost production can be achieved through economies of scale, a phenomenon that is maximized by the lack of competition and sharing of the market. Furthermore, the large amount of capital needed to invest in the infrastructure requires that the single firm, which is the investor, have the needed time to recuperate their investment without worrying about competitors taking away market share.

The telecom industry has historically been considered a natural monopoly due to the large capital investments needed, the declining average and marginal costs, and the economies of scale that produce these decreasing costs.

incorporated large cross-subsidies from urban to rural consumers, which were distorted and did not reflect the real costs (Bonifaz, and Bonifaz, 2004). The situation in which the telecom industry was did not allow the state-owned companies to generate profit, which prevented two things:

1. Expanding telephone coverage to millions of users, worsening the already acute social differences found in the Peruvian society.
2. Improving current service to ensure that the client's needs were covered, especially in Lima.

At the beginning of the 1990s, Peru had the lowest number of phones – public, home lines, mobile - per 100 people in South America: 2.6, compared to an average of 6.5 in the region. Peru's low telephone penetration was due to the low levels of investment in telephone network expansion during the 70s and 80s, which did not even reach US\$ 50 million in the two decades (Webb, 2007). The low investment in the Peruvian telecom sector by the Peruvian government and its state-owned companies can be explained by three main factors:

1. Since 1983 and until 1990, the Peruvian government mandated that public companies stop paying their foreign debt because they had no money to pay operational expenses, no longer making them eligible for credit in the international finance market.
2. The decrease in fiscal income caused by the high government debt that was being payed off plus the hyperinflation that Peru was experiencing severely limited the state's expenditure on infrastructure.
3. The telephone fees, especially local ones, were below the operating costs because of the country's inability to pay more for the fees, not providing the public companies with the needed income to finance their expansion plans.

The problems in the telecom industry led the Peruvian government to begin a gradual

process of eliminating the monopoly by privatizing its state-owned telecom companies, thus, substituting a public sector monopoly for a private sector monopoly. This process began in 1991 with a series of laws that sought to prioritize private investment in the telecom industry. With the passing of the Telecommunications Law in 1993, which established that the Peruvian government would stop offering telecom services and only regulate the industry, the ongoing efforts to provide incentives for the private sector to invest were consolidated.

The process through which the Peruvian government gradually eliminated the state-owned monopoly consisted in the following scheme:

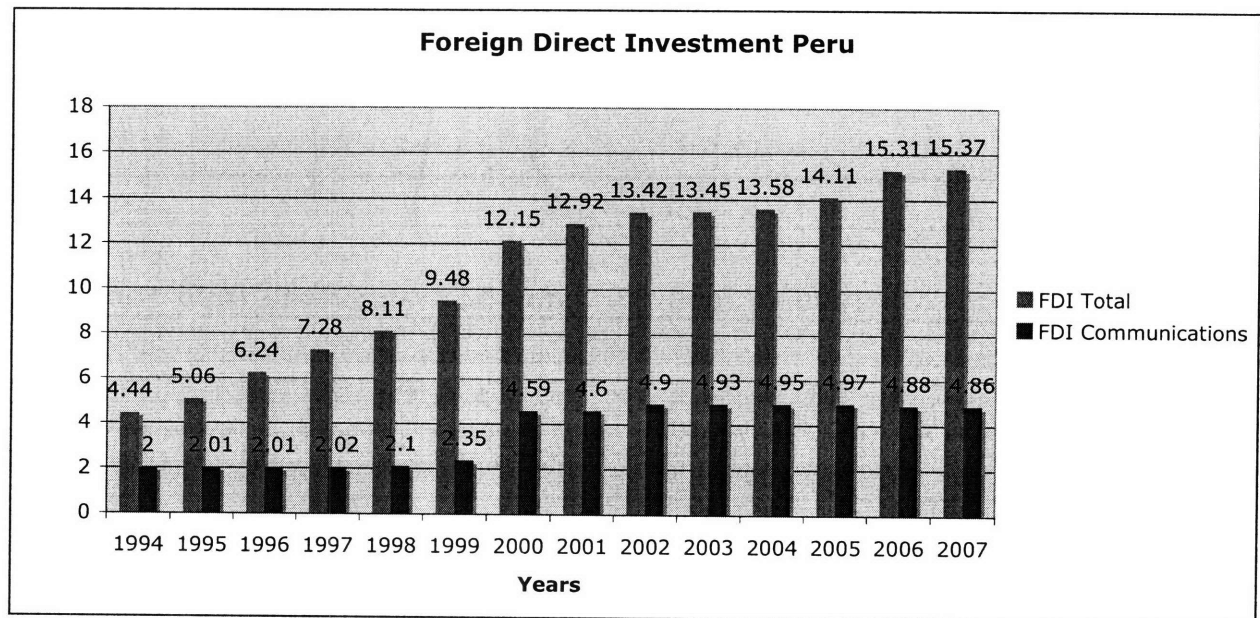
1. The Peruvian government sold its public telephone companies (CPT and ENTEL) to a private company and granted them a five-year exclusive concession over local and distances phone calls.
2. This concession allowed the private company to prepare for competition that took place five years later when the market was opened.
3. In 1994, this privatization process had a Spanish telephone company, Telefonica Internacional de España (Telefonica), as the winner of the international tender. This exclusive concession would transform the public monopoly into a private monopoly.
4. In the first three years of this exclusive concessionary period, Telefonica changed the telephone fees and gradually eliminated the cross-subsidy scheme, as was agreed upon in the contract, in order to cover the service costs. The contract established a limit on the prices that Telefonica could charge on local and long-distance calls. The Peruvian government monitored the Spanish company during the concessionary period to ensure that it complied with the contract's diverse goals and requirements such as increased expansion, infrastructure modernization, and higher quality of services. Before the contract ended, Telefonica had been

successful in complying with the contract requirements.

5. In 1994, the Peruvian government established an agency that would regulate the telecom industry. This state entity was the Organismo Supervisor de Inversión Privada en Telecomunicaciones (OSIPTEL) and its role during the concessionary period was to ensure that Telefonica's fees, quality of service, and obligations, which were established in the contract, were respected. OSIPTEL performed very well and was very strict with Telefonica ensuring that the Peruvian customers received a very good service.
6. In 1998, one year before its contract ended, Telefonica decided to terminate its concessionary contract in order to have an advantage over other competitors that were not ready to participate in an open market.

Since then, the telecommunications industry has enjoyed double digits of growth in mobile telephones and Internet connections, especially in Lima, but more and more all over the country. Currently, the Telecom sector receives the most amount of FDI: 31% of all FDI in Peru (ProInversión, 2008). As seen in the graph below, over the past years the communications sector has constantly received a very significant part of FDI.

Chart 1: Amount of FDI in all Peruvian Industries vs. the Telecom Industry



Source: FITEL Rural Internet Project Presentation

2.2. Teledensity in Latin America and Peru

Teledensity is an index that measures the number of phones (home phones or landlines, mobile phones, and public phones) per 100 inhabitants in a certain region. As can be seen in the following table, Peru has the lowest teledensity in the region: 2.8 vs. 56.3 in 2005.

Table 3: Teledensity in South America

Teledensity in South America			
Total # of Telephones per 100 habitants (including landlines, mobile, and public)			
Teledensity			
	1990	2005	Annual Growth Rate 1990-2005
Chile	6.7	89.8	18.9
Argentina	9.3	80.1	15.4
Venezuela	7.7	60.2	14.7
Ecuador	4.8	60.1	18.4
Brasil	6.5	59.8	15.9
Uruguay	13.4	49.4	9.1
Colombia	6.9	40.1	12.4
Paraguay	2.7	35.8	18.9
Bolivia	2.8	33.4	18.1
Peru	2.6	28	17.1
South America	6.5	56.3	15.4

Source: ITU

By 2005, Peru still held the last place in teledensity in South America as it did in 1990. Furthermore, Peru's teledensity is currently half the South American average. In spite of this, its annual growth rate between years 1990 and 2005 was one of the highest, which can be explained in part by the really low initial conditions, the government's efforts to provide telephone service to a vast number of Peruvians who lacked the service (the government achieved this expansion in service through FITELE projects and by imposing a minimum number of rural phones that the incumbent phone company – Telefonica – had to install before its concessionary contract expired), and by the mobile operators' exponential growth and expansion throughout the country.

2.3. Peruvian Demographics

According to the World Bank (World Bank, 2006), 14,609,000 (54,8%) of Peru's population is poor and 6,513,000 (24,4%) is extremely poor. In rural areas, 72.5% of the population is poor while 40.3% is extremely poor. In urban areas, 40.3% of the population is poor while 7.9% is extremely poor.

Table 4: Poverty Statistics in Peru

Poverty Statistics in Peru		
Total Population		#
		%
		27,000,000
		100%
Poor		13,932,000
		52%
	Urban	40.30%
	Rural	72.50%
Extreme Poor		5,184,000
		19.20%
	Urban	7.90%
	Rural	40.30%

Source: Peru World Bank Report 2006

Peru is a representative democratic republic that is distributed geopolitically as follows:

- Peru is divided in 25 regions
- Each region has a certain number of provinces, totaling 195 provinces.
- Each province is divided into districts, totaling 1833 districts.

The Human Development Index (HDI) for these 1833 districts are summarized in the following table:

Table 5: 2005 Human Development Index in Peru and Districts

	Population	Human Development Index	Life Expectancy	Literacy Rate	Schooling	Level of Education	Per capita Family Income
	Inhabitants	HDI	Years	%	%	%	\$ a Month
PERÚ - 2005	26,207,970	0.598	71.457	91.872	85.372	89.705	285.6775807
AVERAGE	14,313.4733	0.559	67.628	84.807	83.798	84.471	285.678
MAX	812,656	0.809	77.167	99.724	100	98.647	1,270.909
MIN	88	0.401	51.410	50.067	0	52.706	87.112
MEDIAN	4,338.5	0.552	67.788	86.569	86.100	85.209	235.822

Source: United Nations Development Program Peru (PNUD)

2.4. Universal Access and Universal Service

Universal access refers to the capacity of all people to access a certain service or product that will benefit them. Most governments promote universal access in sectors such as health care, electrification, telecommunications, and education. In the telecommunications sector there is a distinction between universal access and universal service, although there is really no consensus on the definition of each term. The former refers usually to traditional telecommunications services such as public and home telephones; the latter refers to more advanced telecommunication technologies such as Internet access and advanced mobile telephone services.

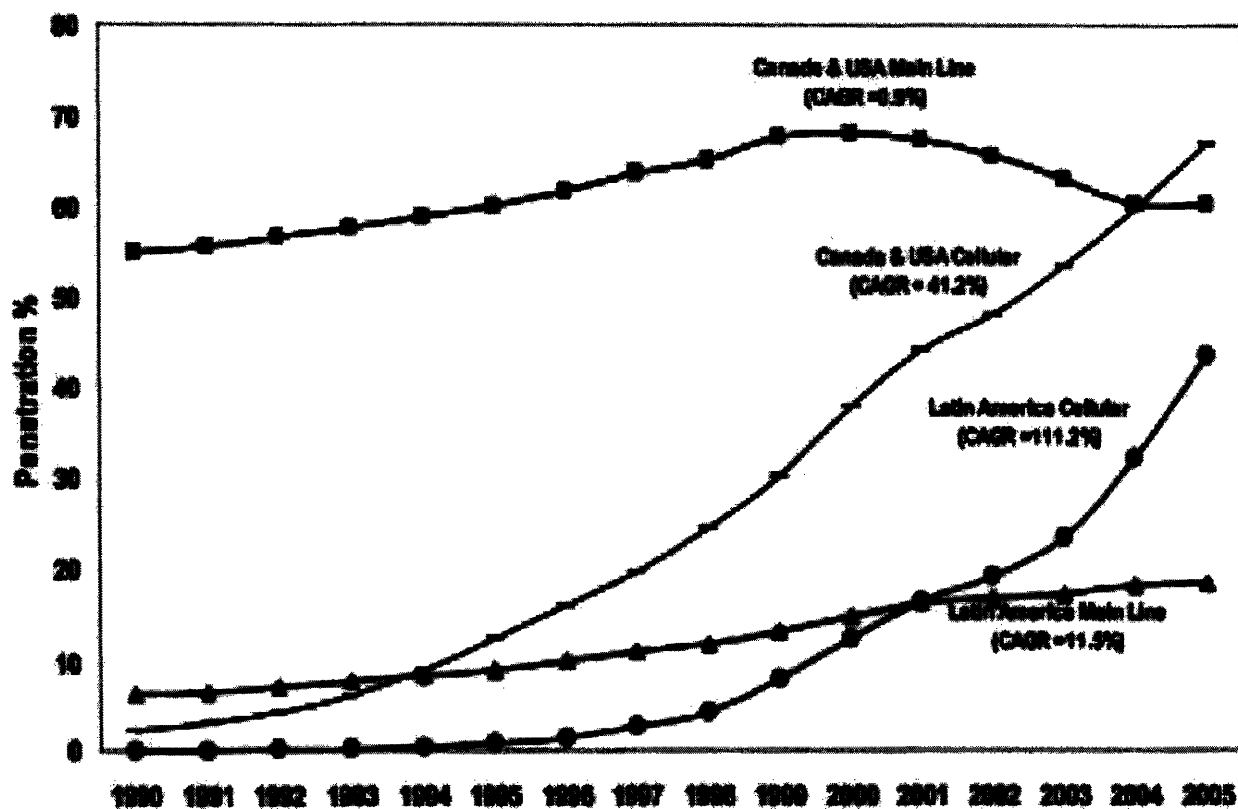
Developing countries have commonly sought universal access due to their very low teledensity rates, while developed nations have sought for greater universal service, where usually most of the population already has been reached by traditional voice technologies. At the present time this distinction and choice between universal access and universal service, and the prioritizing of universal access in developing countries vs. universal service in developed countries, is being left behind as services are becoming more and more integrated – 3G technologies on mobile phones, Voice over IP (VoIP) on internet-enabled networks – and countries, such as Peru and many in Latin America, are embarking on universal service

programs.

There have been several ways through which universal access has been sought in different countries around the world, and especially in Latin America. According to Stern and Townsend (Stern and Townsend, 2006), there are 4 approaches that have been taken, or combined, by countries in their efforts to reach universal access:

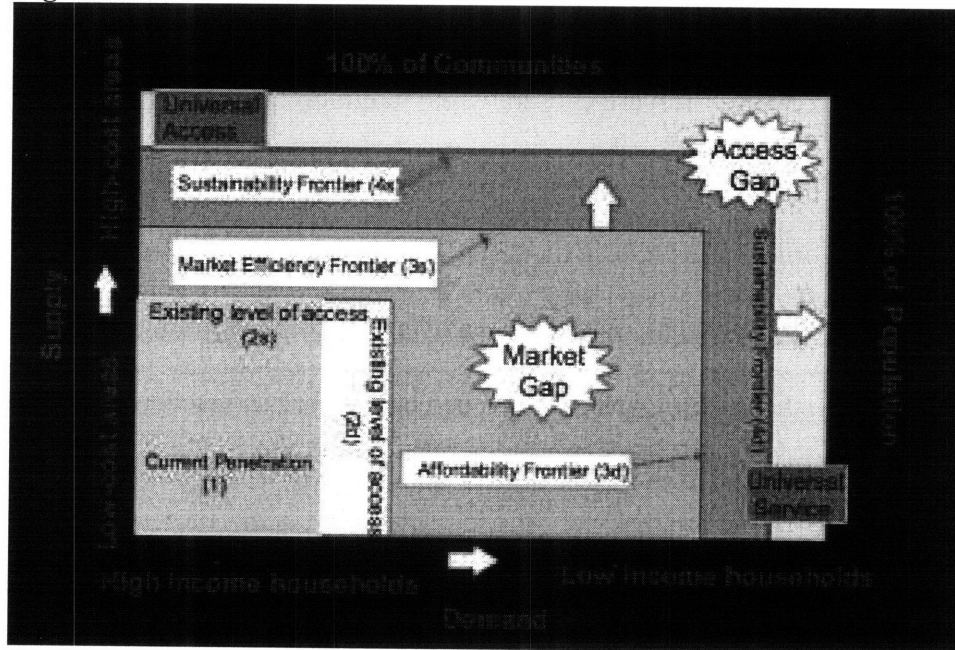
1. Market liberalization combined with regulatory initiatives including universal access obligations and special regulations and conditions that favor projects and operations in areas where the private sector would not invest without government intervention due to an insufficient economic incentive.
2. Universal access funds, which were created to finance projects for the expansion of telecommunication services.
3. Locally crafted financing methods and project initiatives. Led by national, state, and local governments, along with cooperatives, NGOs, and other organizations.
4. State-mandated and controlled approaches using cross subsidies and other financing mechanisms.

Chart 2: Growth of main line and mobile penetration rates in North America (Canada + USA) and in Latin America between 1990 and 2005



Source: ITU WTI 2005, in Stern and Townsend, 2006

Figure 1: The GAPS Model



Source: Regulatel

The GAPS Model presented by REGULATEL (the Latin American Consortium of Regulating Agencies) shows how universal access and service efforts should be targeted to those areas that would never be served by the private sector. As seen in Figure 2, the Market Gap represents all the communities that are currently not served by the market but could be served without subsidies or other government incentives while profiting. The reason why these areas are not being served is usually due to the company's lack of will or because the company is focusing on a different objective group and its resources have already been assigned. In contrast, the Access Gap represents the communities that would never be served by the private sector given current conditions. These areas are uneconomical due to the communities' low demand, low density, isolation, remoteness, low income, and other factors.

In the case of Peru, there is controversy over whether or not FITELE has served the universal access/service gap or rather the market gap. FITELE has definitely not reached the poorest of the poor, which is not necessarily wrong if it was not first intended to reach that group. In general, the communities served by FITELE were chosen by the likelihood that the rural telephones would be used in those locations and that the venture would become sustainable after the subsidy terminated. In other words, FITELE chose the “best” and “most likely to succeed” communities to be included in the RPT projects. While much has been achieved through the RPT projects, FITELE has failed to reach those Peruvians in most need but rather has reached the richest of the poor. In fact, this “creaming” issue was raised in an interview with a Telefonica employee who affirmed that many of the FITELE communities were places that were profitable and did not require a subsidy for the private sector. In other words, and if this were to be true, there would be an inadequate distribution and targeting of the fund’s resources and the private sector involved in the projects would be receiving money that they really did not need in order to make the venture profitable. The FITELE subsidies in many cases are working more as incentives to provide service to specific areas that the private sector is uninterested in than as financial aides to make the venture profitable.

The private companies challenged this accusation by providing some rough figures regarding the profitability of their FITELE phones. The General Manager of Gilat to Home (Gilat), the largest provider of FITELE phones with around 5,100 FITELE rural telephones, said that 10% of the phones were performing very well and making a profit. These phones were generating 70% of the network’s traffic. About 50% of the telephones were making a slight profit; about 25% of the phones were slightly losing money or breaking even; and 15% of the FITELE rural telephones were performing poorly since they were losing money due to the low traffic. About 67% of these

unprofitable phones presented no traffic in periods of 2 to 3 months. The General Manager of Rural Telecom, which has about 930 FITELE phones, said that about 30% of his network is profitable, 30% is breaking even, and 40% of its network is not making a profit.

Peru's approach has basically covered all four different approaches at some point in its history. OSIPTEL, when signing the concessionary contract with Telefonica, required that Spanish company install at least one public telephone in 1,504 rural communities with over 500 inhabitants.

In Peru, universal access in the telecom sector has been sought through the creation of a Telecommunications Investment Fund (FITELE), given the low teledensity figures and the large number of the population that is isolated from the main cities. FITELE was created to increase universal access and reduce tremendous technology gap present in, but not limited to, rural areas.

Alternative models to the telecom investment funds are Municipal owned telecom infrastructure, which are managed as a private business. Examples of cities using these models are:

- Lusk, Wyoming
- Longmont, Colorado
- Anaheim, California
- North Attleboro, Massachusetts
- Cedar Falls, Iowa
- Taunton, Massachusetts

Another alternative to telecom funds and municipal owned telecom infrastructure are telephone cooperatives. These have been prevalent in the US and in neighbor countries to Peru

like Argentina and Bolivia (Navas-Savater, 2000).

In the next section we will analyze how universal access funds work in the telecommunications industry and in what ways governments have set them up as to maximize the benefits.

2.5. Universal Access Funds

Universal access funds have become popular sources of funding in many developing countries as an alternative to cross-subsidies for reaching more people with telecommunication services. The two most common mechanisms through which these funds have obtained their financial resources are: 1) receiving a certain amount from the public treasury and 2) receiving a certain percentage revenues from telecom private companies. The following chart shows the different universal access mechanisms found in Latin America:

Table 6: Collected and Disbursed Amounts in Telecom Investment Funds in Latin America

Country	Fund	Started	Total amounts collected and disbursed by end of 2005 (US\$)		Disbursed / Collected
Bolivia	FNDR	1996	Collected	\$43,461,797	0%
			Disbursed	\$0	
Brasil	FUST	2001	Collected	\$1,772,129,956	0%
			Disbursed	\$0	
Chile	FDT	1995	Collected	\$29,981,000	100%
			Disbursed	\$29,981,000	
Colombia	FCM	1994	Collected	\$448,599,640	37%
			Disbursed	\$165,995,817	
Ecuador	FODOTEL	2001	Collected	\$997,977	0%
			Disbursed	\$0	
El Salvador	FINET	1998	Collected	\$32,701,810	0%
			Disbursed	\$0	
Guatemala	FONDETEL	1996	Collected	\$17,943,154	43%
			Disbursed	\$7,756,518	
Mexico	FCST	1995	Collected	\$25,300,064	100%
			Disbursed	\$25,300,064	
Nicaragua	FITEL	2004	Collected	\$3,278,559	0%
			Disbursed	\$0	
Paraguay	FSU	1998	Collected	\$12,966,954	96%
			Disbursed	\$12,485,360	
Peru	FITEL	1994	Collected	\$143,063,602	32%
			Disbursed	\$45,076,256	
Dominican Republic	FDT	2001	Collected	\$65,654,341	16%
			Disbursed	\$10,774,157	
Venezuela	FSU	2001	Collected	\$113,220,392	0%
			Disbursed	\$0	

Source: Regulatel

As can be seen from the previous table, most of the Telecom Universal Access Funds in Latin America have failed to use the collected money or have used a small part of their funds, which are accumulating money that could be used for other pressing needs. In fact, this pattern of no or little use is what most opponents to Universal Access Fund criticize. These critics sustain that much money is being accumulated but not being spent and that alternative mechanisms

would increase the population's welfare. They sustain that the opportunity cost to having the money in a bank is too high and that the system should be changed.

2.6. Rural Telecommunications in Peru: Telefonica's Experience

In its concessionary contract with Telefonica in 1993, the Peruvian government included an obligation to serve 1,500 rural communities. When elaborating the Rural Public Telephone projects, FITEC officials benefited from Telefonica's experience. Many of the obstacles and problems, along with the opportunities and knowledge, were taken into account when designing the RPT projects. In this section we will describe Telefonica's experience of providing public telephone service to rural communities. The importance of this effort is paramount given that the communities targeted by FITEC were of the same characteristics of those served by Telefonica.

In a recent interview with an employee of Telefonica that works for the Rural Telephone department, he provided the current information regarding the 1,500 telephones that were put in place:

- 500 of these phones were profitable
- 500 of these phones were breaking even
- 500 of these phones were making the company lose money

Also, what they noted was that one of the main problems for expanding telephone services to rural communities was a lack of telecom regulation for rural areas.

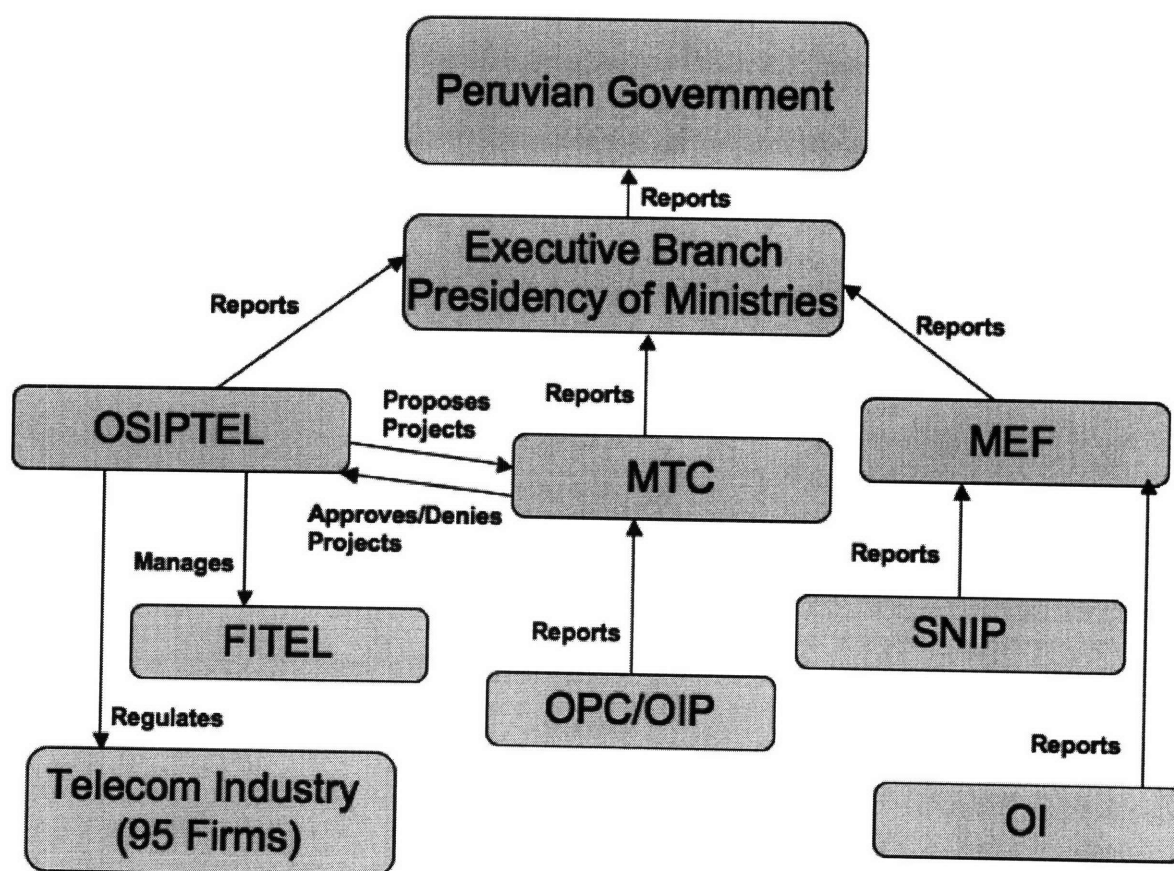
Telefonica's biggest problem was that the rural communities where it was obliged to provide service were isolated and dispersed. Most of these communities were not easily accessible; many of them did not have electricity or other basic services such as water and sanitation. This low density meant high unit costs and did not allow for economies of scale.

Additionally, Telefonica faced problems regarding the technology that it would use. Up to that moment, the technology that was used in Peru to reach remote rural communities and some urban cities was a Multi Access Rural Radio Telephone System (MARRTS) so Telefonica decided to use this technology to provide service to the 1,500 communities it had committed to serve. The problem with this technology was that it was very vulnerable to theft due to the fact that its antennas and equipment needed to be located in a remote and uninhabited area in order to reach as many communities as possible. Telefonica's maintenance and operation costs were a significant part of the total costs, and burglary was common. The frequent theft of equipment not only increased the company's costs in terms of the price to replace stolen equipment or damaged parts and the cost of man power, but also because of the fines that the Spanish company incur if it did not provide a uninterrupted service. This problem led Telefonica to change its technology to VSAT in 2004.

3. The Peruvian Telecommunications Investment Fund - FTEL

In this chapter, I will describe the different aspects of the Telecommunications Investment Fund (FTEL). As can be seen in Chart 4, during the RPT projects FTEL was managed by OSIPTEL, the telecommunications industry regulator, who approved the FTEL projects before presenting them to the MTC.

Chart 3: The FTEL Model during the RPT projects – A Graphical Representation



Source: Personal elaboration

3.1.How FITELE was formed

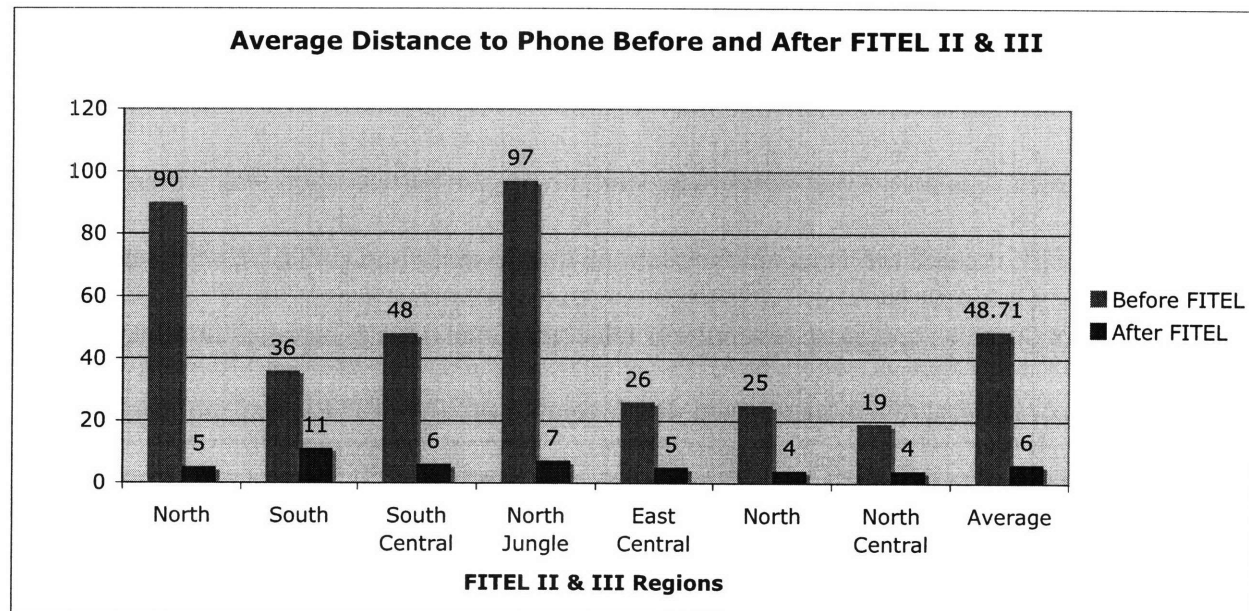
In 1992, the Peruvian government privatized all state-owned telecommunications companies and created a Telecommunications Regulatory Agency (OSIPTEL) (Prior to 1992 all the telecommunications sector was state-owned and no private participation was present). In May of 1993, OSIPTEL created the Telecommunications Investment Fund (FITELE), which began to collect a 1% tax on gross operating revenues of telecommunications companies in order to fund the expansion of the rural telephone service. In November of 2006, FITELE was modified and became an individual public entity associated to the Ministry of Transportation and Communications.

So far, FITELE has implemented several projects, which have mainly provided public telephone services in rural communities but also have included providing Internet connections in some communities. Currently FITELE is focusing more and more on providing Internet access to rural communities.

The focus of this thesis is on FITELE's first four projects, which have reached a total of almost six million people in about six thousand neglected and isolated rural communities. For purpose of simplification, we will group these projects together and call them FITELE's Rural Public Telephones (RPT) projects. In all of these projects, rural public telephones were the main technology, although some of them included a small number of computers with an Internet connection.

The average distance that the benefited community members have to travel in order to reach a public telephone has been reduced from 48.71 km to 6 km after FITELE's projects were implemented. Also, many of the main districts now have public Internet centers.

Chart 4: Average Distance to Phone Before and After FITEL



Source: FITEL

Given the size of the Peruvian population, the prior rates of telecom expansion, and the difference between current and prior average walking distances to public phones, the RPT projects can be considered very successful. On the other hand, the projects could be considered unsuccessful if measured by the nature of problems that were triggered by the projects, the lack of participation from the benefited communities, and a lack of analysis of cultural and contextual aspects of the communities.

Moreover, there has been much variance when it comes to the project's outcomes. Given the vast reach of the FITEL projects, it is hard to aggregate all projects and judge them as successful or unsuccessful. Not only is this approach not reliable or appropriate, it is not helpful when evaluating these rural projects and rescuing lessons learned to apply in future projects, which is why our intention is not to render the FITEL projects in dichotomous categories but to provide an analysis of the process through which these projects were designed and an explanation

of the outcomes.

3.2.FITEL's Vision, Mission, and Objectives

FITEL clearly defined its vision, mission, and objectives. It is important to mention these because as we will later see, one way to judge FITEL's projects is by contrasting the outcomes vs. what the organization itself claims it should be doing.

FITEL's vision was to be the leading organization in Peru that integrated rural communities and preferred social interest with the rest of the country, contributing to the reduction of the digital gap through a continuous improvement of the telecom services and the active participation of the public and private sector.

FITEL's mission was to promote the access to and the use of essential telecom public services in rural and preferred social interest communities, formulating and evaluating telecom investment projects and supervising their proper implementation while contributing to the reduction of the digital gap.

FITEL's objectives were to:

- Reduce the universal access gap of telecom services in rural and preferred social interest communities
- Promote social and economic development in rural and preferred social interest communities, ensuring that the population have access to telecom services and are trained in how to use ICT services.
- Stimulate the private sector's participation in the provision of telecom services to rural

and preferred social interest communities.

It is interesting to note that the first and third objectives were sought actively but the second objective was not really something that was carried out by FITELE. For FITELE, promoting social and economic development meant installing a public phone and assuming that the community would find productive ways to use the phone and to increase their welfare. As will be seen in chapter 4, a problem with the RPT projects of FITELE was that there were no requirements in the contract for training the population in how to use the phone. The private company trained the local administrator in how to use the phone and he was left as the person in charge of showing others how to use the phone.

3.3.FITELE's Legal and Regulatory Framework

The Peruvian Telecommunications Law created FITELE on May 6, 1993. This law establishing the rules by which FITELE was to operate. According to this law, FITELE would obtain its resources by:

1. A 1% tax on telecom companies' revenues
2. No less than 20% of the tax imposed on the radio electric spectrum
3. The resources transferred from the Public Treasury
4. The financial income generated by FITELE's resources
5. The transfers, donations, or assignments of any nature originating from any source
6. Any other source established by law in the future

From 1993 to 2006, FITELE was a part of OSIPTEL, the Peruvian telecom regulator. The fund had its own manager who reported to the President of OSIPTEL. Being a part of OSIPTEL

allowed FITELE to support its operations with other departments of OSIPTEL. For example, OSIPTEL's Monitoring and Control department was in charge of the monitoring and supervision of the RPT projects, and even to this date this area still supervises and monitors FITELE's new projects.

On November 4, 2006, a law was passed determining that FITELE would be an autonomous agency assigned to the Ministry of Transportation and Communications (MTC). The law also established that a board of directors presided by the Minister of Transportation and Communications and conformed by the Minister of Economics and Finance and the President of OSIPTEL would manage FITELE.

This change was a consequence of a strong battle that carried on for years, a battle between OSIPTEL and the MTC regarding the management and use of FITELE's funds. As we will see in chapter 4, this battle negatively affected the design and implementation of projects, delaying the help that thousands of rural Peruvian citizens desperately needed.

At one point, another law was passed that imposed additional bureaucratic obstacles requiring that the National Public Investment System (SNIP), which had a rigorous methodology for evaluating projects, approve FITELE's projects.

From the interviews conducted, every single actor pointed out that one of the main problems with the FITELE projects and in providing telephone services to rural communities in general was a lack of rural regulation. As we will see in chapter 4, the available regulation was not contextualized to take into account the particularities of rural communities.

3.4.FITELE's Subsidy Mechanism – Output Based Aid (OBA)

The FITELE projects that I have focused on were formulated using an Output Based Aid

(OBA) payment mechanism. OBA is a performance-oriented subsidy. The disbursement of the subsidy is tied to the completion of certain contractual requirements. In the case of FITELE, the following performance levels and goals, which were considered the outputs, were required in order for FITELE to disburse the subsidy:

- 35% of the subsidy would be disbursed as an up-front payment after signing the contract with the tender that won. This payment would help buy the equipment needed for the installation.
- 25% of the subsidy would be disbursed after the installation of the equipment in the communities was complete.
- The remaining 40% would be disbursed in equal parts every 6 months for 5 years upon a satisfactory evaluation of the company's operation.

FITELE employed this subsidy structure after evaluating the experience in Chile where SUBTEL (Chile's FITELE) disbursed the entire subsidy after the construction of the telephone network and encountered delays in the operation of the phone network. FITELE observed that the performance-oriented subsidies would work as an incentive to the private companies. After the subsidy ended, FITELE became more strict and rigorous in its evaluations since it feared that the private company would decrease its quality of service due to the extinction of the subsidy. The private sector has complained that FITELE, through its evaluation and monitoring department, has become too rigid and it is putting in danger the sustainability of current projects as well as providing disincentives to the private sector to get involved in future FITELE projects.

The monitoring and evaluation of the projects was done as follows:

- Every six months FITELE would select a sample of targeted communities and evaluate whether or not the private company was fulfilling its contract responsibilities.

- If the company had failed to comply to what was agreed to in the contract, FITELE would penalize the company and not disburse the whole amount.
- If the company fulfilled all its responsibilities, FITELE would disburse the whole amount of the subsidy.

The private companies mentioned in the interviews that the subsidies were not always delivered on time and that several times there was a delay in the evaluations, causing the subsidy payment to be held up.

3.5.FITELE's Bidding Process

FITELE designed the RPT projects and after obtaining the approval from OSIPTEL and from the MTC, it would proceed to call an international bid that had the following characteristics:

- The bidding bases were elaborated
- The bid was called by promoting it in all major news papers and on FITELE's website
- The bidding bases were sold to those who were interested
- The proposal envelopes were received from those wanting to participate in the bid
- On a determined date, there was a public opening of the first two envelopes: the legal one and the technical one
- On the basis of the first two envelopes there would be a qualification to determine what bidders would continue due to compliance with the bidding bases
- After determining what bidders had qualified, the third envelope was opened: the economic one
- The bidder who requested the least amount of subsidy would be declared winner
- FITELE would sign a Financing Contract with the winner, who would receive a 20 year

concession in which they were obligated to provide the telephone service

FITEL decided to be technologically neutral in each of its RPT project's bids. In other words, FITEL did not define what technology should be used by the private company but rather specified the type of service that was required, certain minimum quality standards, an approximate and referential subsidy, and the deadlines for the different phases of the projects implementation. This technological neutrality allowed the private companies to not be constrained to certain technologies granting them the possibility of choosing any technology that would provide the service required by FITEL. Even though the technological neutrality in the FITEL projects had its benefits, it also brought some problems that we will discuss in chapter 4.

3.6. FITEL's Rural Public Telephone (RPT) Projects

Since 1998, FITEL has implemented 4 rural public telephone (RPT) projects. These four projects allocated a total of US\$ 52,075,333.069 benefiting 5,846,166 people in 6,056 rural communities. In all of these projects, the rural public phone was the main technology used, although two of these projects incorporated one computer with a very slow Internet connection in the district capitals. As we will later see, these computers were marginal to the project and were included for political reasons, cause for which we do not focus on these computers.

In the first three projects, none of the rural communities had access to any type of telephone service before FITEL's intervention so the public telephones were the communities' first opportunity to communicate with the rest of the country without having to physically travel or sending a regular mail.

For the FITEL projects to be approved, FITEL had to first design the projects and get an

approval from OSIPTEL, who was in charge of FITELE. After approval, FITELE would send the project to the Office of Public Investment (OIP) of the Ministry of Transportation and Communications (MTC). The OIP would normally comment and request changes if it found any objections to the project. After receiving approval from the MTC, FITELE would proceed to call for an international bid. As we will see in chapter 4, having FITELE need the approval of the MTC through the OIP delayed many of the projects and created additional obstacles.

The objectives and benefits of the RPT projects were clearly defined by FITELE before the projects were implemented. The specific objectives of FITELE's RPT projects were:

- To ensure an adequate, in terms of quality and price, and continuous provision of public telephone service to the chosen rural communities
- To maximize the profit of the invested money for each monetary unit
- To provide transparency when designating the projects and subsidies
- To promote private investment in rural areas

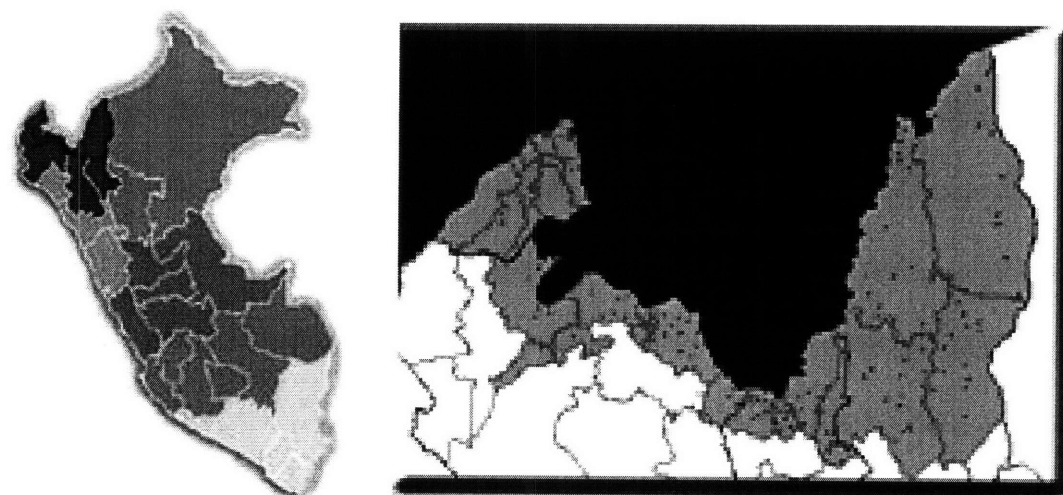
The benefits that were sought by these RPT projects were:

- Reduce the number of isolated rural communities
- Promote commerce of the rural communities' products with other communities
- Diversify the communities' production structure
- Decrease the communication costs
- Decrease the costs of providing public services such as health and education
- Improve the functioning of markets
- Contribute to a greater social cohesion and national security

The first RPT project was called North Border Project or FITELE I, and it was a pilot

project that served as a test for the RPT model developed by FITEI. In this project, 213 communities were provided with a public phone. The reasons why this project was implemented in the northern border with Ecuador was because Peru and Ecuador had been at war 3 years earlier and the government wanted to strengthen the border population's national identity as well as make sure it had communication technologies in the area.

Figure 2: FITEI I



Source: FITEI

As can be seen in Figure 1, the dark green area of the map the map of Peru on the left is the area that was targeted by FITEI I. On the figure to the right of the map of Peru is a zoom in of the FITEI I area with 213 red points in the locations where the public phones were placed. The area in dark purple right above the zoomed figure is the country of Ecuador.

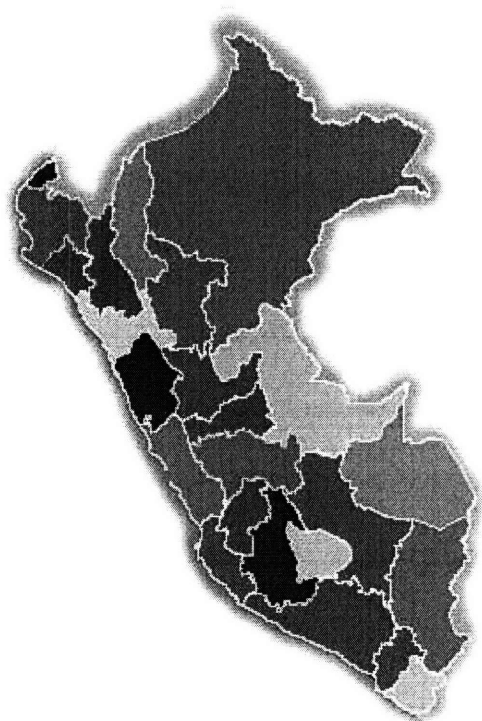
The second and third RPT projects (FITEI II and III) were a massive attempt to provide 5,000 rural communities with telephone service, reaching the universal access objective established in Peru's market opening lineaments, a guideline document drafted in preparation of

the transition from a monopoly to an open market.

The fourth RPT project (FITEL IV) increased the number of public telephones in rural and preferred interest communities where the number of public phones was insufficient to cover the demand. When elaborating the list of communities for FITEL II and III, local authorities requested that FITEL finance and install additional public telephones for communities where the existing service was insufficient due to large populations.

As can be seen in Figure 3, FITEL II, III, and IV covered every region in Peru reaching nearly 6,000 rural communities.

Figure 3: FITEL II, III, & IV



Source: FITEL

Table 7: FITEL Rural Public Telephone Projects

FITEL Rural Public Telephone Projects				
Project	FITEL 1	FITEL 2	FITEL 3	FITEL 4
Contracted Company	Gilat	Gilat	Gilat / Rural Telecom	Gilat / Rural Telecom
Project Description	Rural public telephony	Rural public telephony and Public Internet Centers in Districts	Rural public telephony and Public Internet Centers in Districts	Rural public telephony
Project Inception Year	1998	1999	2001	2001
Years Operating	6 years and 4 months	5.5 years	4 years	5 years
Allocated budget (US\$)	1,833,745.69	10,990,888	27,854,400	11,396,300
# of benefited communities	213	1,937	2,290	1,616
# of benefited inhabitants	144,522	1,546,424	2,300,722	1,854,465
US\$ per community (rural communities and small villages)	8,609.13	5,674.18	12,163.49	7,052.17
US\$ per direct benefited inhabitant	31.15	18.92	25	6.15
US\$ / total benefited inhabitants	12.69	7.11	12	6.15

Source: FITEL

3.7. Local Administrator Selection Criteria

A central part of the RPT model was the local administrator who was chosen by the private company. FITEL did not incorporate any requirements into the contract with the private company although it did recommend that the local administrator be someone in the community with a location that was near the center of the community and that his place be open most of the day.

Lipsky defines a street-level bureaucrat as someone who interacts directly with the citizens in the course of their jobs and who has significant discretion in the execution of their work (Lipsky, 1980). Although not exactly what Lipsky defines as street-level bureaucrats, due to their non-affiliation to a public institution, one can find similarities between Lipsky's description of street-level bureaucrats and two different agents in the RPT projects, which we could call "community-level bureaucrats."

The first community-level bureaucrat is the private company's employee who was in charge of visiting the rural community and choosing the local administrator. The private companies had the following list of characteristics that had to be taken into account when choosing who would be in charge of operating the public phone:

- The local administrator should have an enclosed back yard or area to place the where the equipment (satellite, solar panels, batteries, etc.).
- The local administrator should preferably live close to the center of the community
- The local administrator should preferably have business experience
- The local administrator should preferably own a store or have a business at home that is open all day
- The local administrator should be known and respected by the communities

Out of these characteristics, the only required one was that the local administrators have an enclosed back yard or area in order to increase the safety of the equipment. The private companies mandated this condition because of the high levels of burglary experience by Telefonica in its rural telephone operations. The Spanish company lost millions of dollars each year replacing the stolen equipment and paying the fines that accrued due to the loss of service.

Having previous business experience presumably increased the chances of having the local administrator manage the phone as a business, therefore, more efficiently, and seeking for someone who had a store or a business that was open all day would increase the public phone's availability.

Although the private company employee had to choose someone in the community with an enclosed area, he basically could choose any person that he deemed most appropriate for the job considering the other characteristics. The high degree of discretion and relative autonomy that are common to street-level bureaucrats was experienced by the private company employee in charge of selecting the local administrator due to the remoteness of the locations where the employee was sent.

The second community-level bureaucrat is the local administrator that was chosen by the private company employee. The local administrator, as we will see in section 3.9 and in chapter 4, was a critical factor in the RPT projects. The discretion enjoyed by the local administrator allowed him to run the business as he pleased. As we will see in chapter 4, the discretion enjoyed by the local administrator, along with the monopolistic situation of the local administrator, resulted in different outcomes. Although the private company did supervise the local administrator sporadically and in some cases changed who the local administrator was in the community, the local administrator had much freedom to manage the public phone service without the private company controlling or regulating the situation.

3.8. Rural Communities Selection Criteria

When determining the communities that would be targeted, FITELE's first challenge was to define the selection criteria that would help filter the thousands of isolated and poor communities

that would benefit from telephone services. FITEI's defined "rural communities" and "locations of preferred social interest" as:

- Communities with up to 3,000 inhabitants
- Communities with less than 100 contiguous homes or more than 100 dispersed homes.
- All capitals of districts that complied with the previous two conditions, in spite of being urban according to the INEI, were automatically considered as candidate communities for FITEI projects

The FITEI communities placed much value on having a public phone in their location so they made their requests to FITEI and OSIPTEL by letters, phone calls, and office visits. The number of requests up to year 2001 is as follows:

Table 8: Telephone Service Requests to OSIPTEL by Department in Peru 1994 - 2001

Year - Departament	1994	1995	1996	1997	1998	1999	2000	2001	Total Requests by Department
Amazonas	0	2	5	2	1	92	82	235	419
Ancash	11	5	7	13	17	29	127	27	236
Apurímac	1	1	9	2	9	17	62	26	127
Arequipa	1	0	0	0	6	3	26	4	40
Ayacucho	1	7	2	0	1	93	138	19	261
Cajamarca	6	16	10	8	16	159	234	56	505
Cusco	0	0	4	1	12	70	93	21	201
Huancavelica	1	0	18	8	4	44	111	16	202
Huánuco	2	0	4	37	5	18	49	22	137
Ica	0	0	0	0	0	1	10	0	11
Junín	1	2	6	6	0	38	65	24	142
La Libertad	2	0	1	0	4	49	136	22	214
Lambayeque	0	0	0	0	0	2	41	0	43
Lima	1	0	9	3	13	84	134	16	260
Loreto	0	0	0	0	1	10	6	1	18
Madre de Dios	0	0	0	1	0	5	3	0	9
Moquegua	0	0	0	0	0	0	10	0	10
Pasco	2	1	0	1	2	7	18	10	41
Piura	0	0	6	7	1	33	27	12	86
Puno	0	1	1	2	9	15	132	11	171
San Martín	0	3	0	4	7	22	77	6	119
Tacna	0	0	0	9	0	6	5	1	21
Tumbes	0	1	0	0	0	1	2	0	4
Ucayali	0	0	2	0	10	10	17	11	50
Total Request per Year	29	39	84	104	118	808	1605	540	3327

Source: FITEL

As can be seen in Table 8, as we get closer to year 2001, we can see a reduction in phone requests. This reduction is due to the FITEL projects that were implemented. In spite of great advances made in the public telephone expansion, government officials in FITEL, OSIPTEL, and the MTC say they receive hundreds of requests requesting telephone services in their communities each year.

After FITELE had defined what it considered to be a rural community, it continued with the selection of rural communities. The rural communities that were considered by FITELE were defined by a baseline survey conducted on rural communities. Out of this survey a certain type of rural community was chosen in order to choose the universe of potential rural communities and the demand for telephone service was forecasted. Next, a methodology was developed to optimize the selection of communities maximizing the economic benefits of each phone installation. This methodology had two phases: (1) selection of a list of rural communities by FITELE employees based on their data and information; and (2) conduction of workshops with local authorities to verify the communities selected by FITELE and to assign priorities.

The selection and grouping process of rural communities was as follows:

- An initial list (universe list) of rural communities was elaborated
- An area of study was selected
- A list of possible rural communities that could be served by FITELE was elaborated
- A list formulated by FITELE employees of selected and grouped rural communities that fulfilled one or more of the following characteristics:
 - Community with one of the largest populations in the province
 - Community with a high school
 - Community with a health center
 - Be situated at the intersection of access ways (rural roads, river crosses, horse paths, etc.)
 - All districts of capital were chosen
- Field visits were made to the selected rural communities in order to assess whether the installation of public phones was technically viable.

- Workshops with local authorities (district mayors) as well as with representatives of the civil society were held in capitals of district in order to contrast and verify the list elaborated by FITELE employees in order to obtain a final list with prioritized locations
- A finalized list was elaborated with the selected rural communities, which shared similar characteristics such as level of development, size of population, economic activities, and accessibility

FITELE used the finalized list in its three first RPT projects, dividing the projects according to grouped areas in order to take advantage of economies of scale.

3.9. The Technology

Very Small Aperture Terminal (VSAT) technology was used in the RPT projects. This technology was chosen in all of the projects because of the harsh geographical conditions found in Peru that prohibited the use of landlines or mobile telephones. VSAT equipment is a technology that enables the center of operations in Lima to communicate with the rural community and provide telephone service through an aerial satellite while allowing for high levels of service availability (Grupo de Telecomunicaciones Rurales, 2008).

The elements of the FITELE VSAT telephone system are the telephone receiver that works on pre-paid cards, a terrestrial antenna, pre-paid phone cards, solar panels, batteries, and an aerial satellite that transmits the data from the rural community to Lima and vice versa.

As we will see in the next chapter, the technology used presented some challenges to the RPT projects due to an incompatibility between the method of payment (pre-paid phone cards) and the rural communities' economies and culture.

3.10. The Actors or Stakeholders

The FITELE projects had several actors and stakeholders that played an important role during all of the rural telephone projects.

The Local Administrator or Local Concessionary

The local administrator was key to the proper functioning of the FITELE projects and his role along with the impact he could have on the projects' outcomes was underestimated by the project designers as we will see in the next chapter.

The local administrator was the person who would manage the public phone. Since he was the only person in the community that had been formally trained by the private company on how to use the phone, by default he was the person that would provide help to locals trying to use the phone.

The local administrator was generally a small-scale farmer, as were most of the community members. Most of the people in rural areas had very small parcels, which served to produce potatoes, tomatoes, corn, and other typical agricultural products that were used mainly for their own consumption or in exchange for the products of other farmers in the community. Since the economy of these communities was basically of subsistence, harvest surplus was very small, if any.

The local administrator would come to an agreement with the private company. This agreement was not a formal contract, but rather a non-binding agreement of operation that placed no legal responsibility on the local administrator for the equipment or service provision.

The local administrator's responsibilities were to:

- Provide access to the public phone by placing the phone in a location of his home that was open from 8:30 am to 8:30 pm
- Maintain a stock of the different pre-paid phone cards: 3, 5, and 10 soles (1 dollar is about

2.8 soles)

- Inform the private company of any problems with the equipment or complaints from the community

The local administrator's benefits from managing the phone were:

- Earn a commission on the sale of pre-paid phone cards. The phone cards were sold below the cost to the local administrator: the 3 soles card cost him 2.8 soles, the 5 soles card cost him 4.7 soles, and the 10 soles card cost him 9.4 soles.
- Earn about 0.5 soles each time he passed on a message from someone who had called to speak to someone in the community or when he went out to let someone know that they were going to be receiving a call at a certain hour.

Since the local administrator's main source of income prior to managing the public telephone was his crops, the prospects of being in charge of a public telephone was very appealing not only because of the additional source of income that managing the phone entailed but also due to the social prestige and power that the phone brought upon him. Being in control of the only public telephone in the community elevated the farmer's status from being a normal community member to being the manager of the only means for communication in the community and the gatekeeper to such an advanced piece of equipment.

As we will see in the next chapter, the local administrators' expectations of the public phone's benefits were greater than the real benefits. This unforeseen phenomenon brought upon the RPT projects problems that would prove difficult to solve or mitigate.

The Community members

The community members were mostly farmers that produced beans, tomatoes, potatoes, corn, or lemon on their own small parcels or had a small herd of sheep, cows, pigs, or horses. Most of them had a subsistence economy, and many of them traded their products for those of their neighbors.

Rural community members in Peru have strong family ties and place much value on extended family relations. The rural telephone is a perfect instrument for them to foster their social networks. Many of the people living in the targeted FITEC communities did not know how to read or write, and some older people did not speak Spanish but rather Quechua, Aymara, or other indigenous languages. The public telephone was the first opportunity for many of the community members to interact with some sort of modern technology. Moreover, there were community members that had traveled to other communities or main cities due to business or family matters and had been in contact with public telephones or other more advanced technologies.

As we will see in the next chapter, the community member's economic conditions, culture, and level of development affected whether and how they used the phone.

The Local authorities

Contrary to what one would assume, the RPT projects had little local authority participation. The only moment when local authorities participated in the projects was when FITEC contrasted and verified its initial list of possible communities with the local authorities of some capitals of district, but even then it was a small sample compared to the universe of possible communities.

While the literature on ICT for development recommends that local authorities participate

in projects that incorporate technology as a means to foster economic development, the RPT projects left the local authorities out of the process. The reasons why this occurred is because the projects were implemented and operated by the private sector as a business, so the private sector tried to run the projects as a business, isolating them from any political pressures.

Local authorities did exercise some pressure by suggesting to the private company's where the public phone would be most appropriate and whom should receive it. These pressures usually were clientelistic and benefited the mayor's friends or family. Despite these pressures, the private company usually enjoyed the needed discretion to choose where to install the phone. If the local authorities did not agree with the private company's decision, they might put pressure on or hassle the local administrator. What was common in FITELE's rural communities is that the local authority took credit for the public telephone's installation.

The NGO/Non-Profit sector

A very interesting fact of the FITELE RPT projects is that the non-profit sector has been virtually absent from the discussions, design, and implementation of the projects. There are only a handful of cases where non-profits have taken advantage of the RPT projects and formulated their own projects. The two most known cases are that of non-profits: CEPES, a Peruvian non-profit, and ITDG, a British charity. Both of these organizations formulated their own projects over the technology and services provided by FITELE and offered an added value service to the community members. For example, ITDG developed six community-based web pages while CEPES created a Rural Irrigation System that allowed the water users of a certain province to access important information such as prices over the Internet.

As will be seen in chapter 4, the absence of the non-profit sector as an advocate for the

rural communities was definitely a factor for the persistence of some of the RPT projects' problems.

Government Officials

There were different actors and organizations involved in the RPT projects. Among them the most important actors were the FITELE employees. These employees were a mix of engineers and economists and were in charge of designing the RPT projects. FITELE officials created the whole RPT strategy. Another very important group of government officials were the OSIPTEL employees, who supported FITELE's operations by providing expertise in regulation, supervision and control, and an overall understanding of the industry.

The MTC officials were in charge of approving or observing the projects presented to the MTC by FITELE for approval. As we will see in chapter 4, there was a redundancy problem between FITELE, which led to a political fight that hindered the approval and, therefore, the implementation of the RPT projects.

Politicians

Politicians played an important role in that their pressures and requests influenced where the phones would be installed at the beginning of the RPT projects. Moreover, after that initial phase, FITELE's projects were pretty shielded against politicians' desires of location but not against political ideas like the addition of an Internet connection in every capital of district, as we will see in chapter 4.

Telefonica

The Spanish company played an important role in that it provided information and data on rural telecommunications in Peru. Given that the monopolist company served around 1,500 rural communities and had about an average of 7 years operating in rural communities by the time the FITELE RPT projects were being designed and implemented, its experience was very valuable to the private rural operators interested in participating of FITELE projects.

The Private Companies

Two companies participated in the RPT projects of FITELE. One of them was an Israeli company, Gilat to Home (Gilat), and the other a Peruvian company, Rural Telecom.

Gilat is a manufacturer of communication equipments, such as satellites, antennas, and phones, and entered the FITELE projects with very little prior experience as a rural operator. The FITELE RPT projects were a great way for the company from Israeli to secure a large sale of its satellite public phones, also granting them an advantage in costs when presenting their bidding offer.

Gilat currently operates 5,126 of the 6,056 FITELE rural telephones. Given its large operation, it has been able to take advantage of economies of scale, but has also been more vulnerable to servicing such a large network. On the other hand, Rural Telecom operates 930 of the 6,056 FITELE rural telephones. Its advantage is that it has been very efficient at carrying out its business. Gilat is seen as the “bad guys” and Rural as the “good guys” by the government organizations because Gilat has had many more errors and problems in its network as well a lower service availability compared to Rural Telecom.

External Consultants

The Peruvian government through FITELE and OSIPTEL hired external consultants who

provided specialized reports on themes like traffic analysis, universal access best practices, telephone uses in rural communities, financial analysis, and regulatory analysis.

3.11. The Socioeconomic Benefits

What has complicated a serious and rigorous analysis of the socioeconomic benefits of the public telephones on the communities is that a base line study was never done for any of the four RPT projects. Without the information prior to the implementation of the projects, it is complicated to gauge how much of the development in these communities can be explained by the FITELE public telephones and how much of the development is accounted for by other factors. Another problem that challenges the understanding of how things were before compared to the current state is the little data available on most socioeconomic activities. Many of these communities trade their products and have a subsistence economy. Prices are not necessarily set or known, and expenditure functions are not clear either. For all these reasons, the construction of a counterfactual in order to estimate the public phone's socioeconomic impact is practically impossible. Additionally, as already mentioned, the communities chosen for the FITELE RPT projects, although rural and poor according to national statistics, were, in most cases, the communities that were most likely to succeed.

In this section I present the socioeconomic benefits observed from my trips to 17 FITELE communities.

The main benefit derived from the public telephone in the rural communities targeted by FITELE's RPT projects was the social benefit. When interviewing the community members, local administrator, and local authorities, the same answer was always prevalent: *"the phone allows me to call my family and friends."*

The second benefit was the economic benefit derived from the public phones. The phone

allowed farmers who had a surplus in their production to call the closest city and ask a friend or family member what the prices of their specific product were, allowing them to sell the product at a fair price and not be negatively affected by the buyers who would travel to the rural communities in order to buy agricultural products. For those who had a small store, the phone enabled them to ask someone to send them a certain amount of products that needed to be restocked. This allowed the storeowner to reduce transaction costs by not having to travel to the nearest market – usually in the nearby main city – but rather just pay the price of having it sent to their community. For those who had a transportation business, it allowed them to know if there were passengers that needed to be picked up in a nearby community instead of traveling to the community and taking the risk that there would be no passengers, thus wasting gas and time.

4. FITELE Findings: Unintended consequences and Unforeseen Outcomes

During the process of conducting research on FITELE and its RPT projects, I was constantly discovering findings that were not in the literature, had been unforeseen, or were unintended consequences of the RPT projects. In this chapter I present those findings hoping to explain how they led to certain outcomes and contributed positively or negatively to the RPT projects' success or failure.

4.1. Everything looks bad in hindsight

Depending on who is asked, the FITELE projects were very successful or a complete failure. An interesting phenomenon is that when asked today on their opinion about the RPT projects, people who were not involved in the design and implementation of the FITELE projects tend to dismiss them as failures because they involved an "old" technology like rural public telephones. This judgment usually comes along with a remark on how FITELE should have provided Internet access as well given that the future of communications is the Internet. On the other hand, those who used to work for FITELE and were heavily involved in the formulation of the projects mention that the FITELE projects, although having limitations, were the best and most feasible solution conceived under the political, financial, technological, and geographical constraints experienced by their administration.

Although the limitations of the technology used by FITELE in its RPT projects and the problems that the projects encountered are valid arguments, what most people giving this opinion forget is that during the formulation of the FITELE RPT projects (late 1990s), the Internet was still immature and not widely used in countries like Peru. Also, many of the problems that critics raise

were unforeseen by FITELE employees, not due to their incapacity as professionals, but rather to their inexperience with applying certain technologies in contexts that were unfamiliar to them, such as implementing pre-paid telephones in rural communities, or under extremely volatile political environments (during the late 90s and early 2000, Peru experienced the biggest corruption scandal in its history when former president Alberto Fujimori fled the country in an attempt to escape incarceration). Since similar countries like Ecuador, Colombia, and Bolivia in the Andean region of South America had never used the technology as employed by FITELE, the Peruvian organization was not able to learn from these countries' experiences. In the case of Chile's experience, Peru and Chile's geography and socioeconomic conditions were very different, not allowing for the adoption of most of Chile's learned lessons, except in the case of not using coin slot pay phones, which FITELE decided not to use because of the payment complications and very high maintenance and operating costs experienced by Chile.

In general, the RPT projects have experienced problems of two different natures: (1) problems related to the design, approval, implementation, and supervision of the projects, problems generally experienced by FITELE, OSIPTEL, and the MTC; and (2) problems related to the outcomes of the projects, in other words, the day to day operational problems, generally found in the rural communities.

4.2. The Design, Implementation, and Supervision Problems

FITELE's RPT projects have been infested with design, implementation, and supervision problems. The most common problems are:

4.2.1. Designing rural projects from an urban perspective and worldview

Many of the most important problems that the RPT projects faced resulted

from a lack of understanding of rural communities. FITEP professionals the projects taking into account their urban understanding of reality. Rural communities, especially those targeted by FITEP, have totally different economies, cultures, and values. For example, having the community public telephone operate from 8:30 am to 8:30 pm makes sense when one observes how public telephones are used in a large and dynamic city like Lima but makes little sense when one understands the social dynamics of the rural Peruvian world. In Lima, as in many urban cities, the public telephone is used on the go and to convey brief messages that are pretty urgent. Any private conversation would not likely be held at a public telephone nor would long conversations. Public telephones have traditionally aided people that needed to make a quick, but important and informative, call when they are out in the street carrying out their normal life activities. Public telephones are placed in heavily transited locations to aid the person who needs or wants to make a call. By contrast, public phones in the RPT projects have traditionally experienced most demand at later hours during the day when community members have returned to their homes from working on their parcels. Unlike urban areas in Peru where people tend to travel towards a center location where many different offices reside and where public telephones are placed due to the expected demand, rural areas in Peru experience an inverse effect: people tend to travel away from the center of the community – where the phone is usually placed – and towards their parcels, which are scattered across the nearby mountains and lands. This movement away from the public telephone by a large portion of the population, at least those who work on the land during the day, translated into fewer calls made compared to the late afternoon

when community members return home from work. In many communities lines are formed at the public telephone between 6 pm and 8:30 pm because, unlike urban public phone users, rural people use the phones to talk for slightly longer periods with their family members, who are most likely returning home as well.

4.2.2. Fierce Competition Among Government Agencies

FITEL faced fierce competition from within government, where a battle for control and recognition took place, delaying the FITEL's RPT projects. While competition among government agencies can bring benefits like increase in productivity and efficiency in the agencies' processes and outcomes, competition can also create obstacles and problems that may hinder the agencies' performance. Given FITEL's prestige among government agencies and its highly technical work, the Vice minister of Communications attempted to do the same type of projects in an effort to obtain recognition. In 2004, The Ministry of Transportation and Communications (MTC) created its own Office of Communication Projects (OPC) with functions and objectives virtually identical to those of FITEL. The main difference was that FITEL had accumulated a great amount of money through the 1% revenue tax it charged the private telecom companies while the OPC had no available funds (it had to apply for money from the public treasury as did all the other ministries and public entities). Additionally, FITEL's projects did not have to comply with the National Public Investment System's (SNIP) requirements because its funds were not considered as part of the public treasury, which granted it discretion over the money that had been accumulating in the fund. Before the OPC was created, the MTC approved the projects without much trouble but after the creation of the OPC, the MTC would direct the projects sent to them for approval by

FITEL to the OPC, who would make many observations and delay the approval of FITEL's projects. As a former general manager of FITEL said to me in an interview, the OPC had orders to not approve any of FITEL's projects. Furthermore, the OPC would copy the projects that FITEL would present and present them as theirs in order to seek funding from the public treasury through the SNIP. Unfortunately, no significant project was implemented by the OPC. This adverse institutional arrangement impeded that many of FITEL's projects be approved in a timely manner, adversely affecting the rural communities who needed the help. While FITEL denounced that the MTC, and specifically the OPC, hindered the implementation of the projects, the MTC and OPC would argue that FITEL needed to comply with the highest standards because it was using the public money that could be invested in other ventures that were also needed, such as health, education, infrastructure, etc.

While the battle that took place between FITEL and the MTC adversely affected the RPT projects and the targeted populations by delaying the projects, there were also considerable benefits that have gone unseen and no one seems to acknowledge or recognize. Since the MTC was very strict when evaluating FITEL's projects, FITEL employees were extremely careful and rigorous when elaborating their projects. Since FITEL knew that they faced opposition from the MTC, they were forced to create excellent projects in order to reduce the possibilities that the MTC would observe and return their projects. In the end, this intergovernmental battle brought a positive outcome and benefits to the targeted communities.

4.2.3. Exogenous Changes

Another problem was that in 2004, FITEL's projects were no longer considered as

private investments but as public investments, meaning that the SNIP was going to be evaluating them. Although this probably improved some technical aspects of the projects, it further delayed them due to the SNIP's rigorousness. FITELE personnel were trained for six months in the SNIP's methodology (Cost-Benefit Analysis) before being able to design new projects. Furthermore, in November 2006 FITELE was transferred from OSIPTEL to the MTC through a law that was passed, putting an end to the impasse that had been generated by the internal conflicts between FITELE and the MTC. As would be expected, many of the FITELE professionals left or were removed from their positions. As of today, and due to the incorporation of its projects into the SNIP, FITELE has taken longer to design its projects and has found it difficult implement them because of the SNIP's additional controls and requirements. Additionally, having the projects considered as public investments meant that the social benefits were an important part of the project. This change of focus was a disincentive for the private sector who were not interested in the social aspects of the project and saw the economic profit decreased with the changes.

4.3. The Outcome Problems

As most development projects, FITELE's RPT projects had mixed outcomes. Some of the communities had no problems (roughly 10%), others found some minor problems that did not significantly affect the phone's use (roughly 55%), while others experienced all sorts of problems (roughly 35%) that, in the end, had adverse effects on the telephone's frequency of use and type of use. Some of the most common problems were the following:

4.3.1. Problems in the relationships between the local administrator and the community members

Many local administrators expressed that the public phone had become a burden to them and that the expectation of additional income was just an illusion.⁴ In some cases, the local administrator would leave a friend or family member in charge of the phone and of the phone cards while he would leave momentarily. These complaints against the local administrator are important because they raise two problems that were typical in the RPT projects: (1) a problem of privacy, and (2) the problem of having the public phone in a private place. Since information tends to travel quickly in small communities, community members did not experience the needed privacy to talk about certain issues nor could they be sure that the local administrator would not listen and then inform others what he heard and the community members were being adversely affected when the local administrator needed to leave for some reason and had no one to cover for him.

Some communities experienced a very good relationship with the local administrator while others had a terrible relationship. The nature of the relationship (good or bad) had a direct impact on the project's outcome in that community. When the local administrator was respected and considered nice by the community (evidence of this came from the surveys and interviews held with the local community members), there seemed to be a greater willingness to use the phone by the community members as well as a greater chance of improving the provision of telephone service by the local administrator. These benefits that spurred from the positive relationship between the local administrator and the community were due to the fact that the community members had no problem of going into the local

⁴ Many of the local administrators had to continue providing the phone service because of the arrangement they had with the private company. If the local administrators did not want to have the phone any longer, they would just stop caring about providing the service and the private company would notice the decline in traffic and receive the complaints from the community members and eventually give the phone to another person in the community.

administrators home or paying him for his services (when he received and transferred a message). When the relationship between the local administrator and the community was antagonistic (due to the local administrator not treating them well or not helping them if they had problems, or if the local administrator eavesdropped on their conversations, or if the local administrator closed the area of his house where the phone was located and left), the community members wanted nothing to do with the local administrator and took him as a disincentive to using the phone. Paying the local administrator for a service or going into his house was just not an option for the unhappy community members. On the other hand, there have been many cases of communities where, contrary to what the literature would say about his monopolistic situation, the local administrator would improve the telephone service and experience by installing a phone booth to ensure customer privacy, installing light bulbs, selling snacks and beverages, and installing a megaphone in order to announce when a community member is being called. These local administrators found in the provision of telephone service a way to serve their community and find pride in their work. As Tendler observed when looking at public service agents in the health sector of Brazil, many individuals providing public services are proud of serving the public and want to go home at night feeling like they have done good to others (Tendler, 1997).

One example of a common problem between the local administrator and the rural communities was the issue of privacy. A complaint that community members frequently raised about the local administrator was that he eavesdropped on their conversations. Since the local administrator was a monopolist he could just sit down

in his own room or store or wherever he had placed the phone and listen to the conversations that took place. Another common complaint was that the local administrator would leave his house and close the place where the phone was located. When asked about this accusation, the local administrators would usually say that the only way for them to live was through the income generated from their crops.

These problems with the local administrator had tremendous implications for the RPT project's outcomes in terms of type of use and frequency of use. First, the problems affect the possible type of use because many people would abstain from talking about certain issues reducing the potential phone benefits and the amount of possible traffic. In other words, if a community member feared eavesdropping from the local administrator he probably will not discuss certain topics to his family or friends and if there is no other issue to be discussed, he will not place a call. Second, the community member's animosity towards the local administrator generated by his spying would prevent the community members to utilize the phone unless under an emergency. Third, the local administrator's absence and consequent closing down of the location of the phone reduced the number of hours the public phone was available to the community members. By observing the project's outcomes and visiting the communities we can conclude that the local administrator was underestimated by the decision makers during the design phase of the projects. This underestimation is common in rural projects that are elaborated in urban settings and FITEL recognizes, in hindsight, that it incurred in this error.

4.3.2. Problems with the type of technology and how the money was collected

Another important problem was the fact that the public telephones employed in the RPT projects used pre-paid telephones instead of coin slot telephones. The reasons why are fairly obvious from the private sector's point of view. Given that most of the rural communities are isolated and very difficult to access, the private companies reduce the operating and maintenance costs by selling pre-paid phone cards to the local administrator in the main cities, who then must sell the cards to the community members interested in using the public telephone. When buying the pre-paid phone cards, the local administrator had the problem of transaction costs incurred in and money that could not be used on other businesses because they were invested in the form of pre-paid phone cards, which had a slow turnaround. Critics, as well as most community members and local administrators, would have preferred coin slot telephones and complained about the pre-paid telephone. From the community member's point of view, the pre-paid phone cards were a problem because community members, who were of modest means, preferred to pay for each call they made instead of paying an upfront amount for a phone card. The cost of making a local call was 0.2 soles and 1 sol for calling a cell phone, or about 8 cents of a US dollar for local calls or 30 cents for calling a cell phone, at current exchange rates. Many times, the community members did not have the needed amount to buy the card of minimum value, which cost 3 soles or about 1.2 US dollars at current exchange rates, because, as is common in many rural communities, the community member's expenditures were done at a daily basis and with no possibility of buying for future use. This payment problem was amplified when, due to the higher demand

for the card of lowest value, the cards of lower value were sold out. What is not known by most FITELE critics is the fact that FITELE decided not to tie contracts for the RPT projects with coin slot telephones because of the problems that Chile's investment fund experienced with these types of phones and when collecting the money. Not only is it highly expensive to travel to each rural community and collect the money (or highly troublesome to establish an agreement with the local administrator through which he is responsible for collecting the money and taking it to the nearest city to deposit in the private company's bank account on a regular basis), the technology used in coin slot telephones is much more sensitive to dust and weather conditions, and prone to human manipulation and burglary than pre-paid telephones because of the additional technology needed to handle the coins, increasing the cost of the telephone's maintenance.

Also, although the choice of VSAT was appropriate as a way to reduce costs due to the harsh geographic conditions, it introduced a delay into the communication that affected the quality of service. Interestingly, community members did not really complain about this issue.

4.3.3. Where are the advocates? - A collective action problem

Another one of the problems has been the lack of pressure on the private sector and the government, namely FITELE, from the population, political actors, local authorities, or non-profit sector. One of the reasons for this lack of advocacy can be explained by Mancur Olson's (Olson, 1965) collective action problem. Thousands of isolated communities would like to have access to phone services, and thousands of the communities that do have the service would prefer it to be different (better quality of

service, lower rates, the possibility of having coin-slot telephones instead of phones working with pre-paid phone cards, more privacy, etc.). The reason why all these actors have not been able to influence the government authorities is because of their isolation and lack of communications mechanisms between each other. What occurs in each of and across all these communities is a typical example of a collective action problem where people and groups that would benefit from grouping together and pushing for reform are not able to communicate and connect. It is also surprising that the non-profit sector in Peru has been rather silent on the issue of rural telecommunications given that it is extremely active in its advocacy in other industries such as the mining industry. One hypothesis for this lack of advocacy from the non-profit sector is that most non-profit organizations in Peru are not strong on technical issues like telecommunications and prefer to focus on problems in which they have gained certain experience and understanding. Another hypothesis is that non-profits focus mainly on the activities that are actively affecting rural communities in a negative way, such as some mining activities, but not on activities that are not present but should be due to the passive negative effects they have on the population due to decreased opportunities for development.

5. Conclusions

The Peruvian Telecommunications Investment Fund (FITEL) is an example of a public policy put in place to correct a market failure, one in which the market does not serve certain communities because doing so would not provide a profit for the private companies, and in some cases, make them incur in an economic loss. The Peruvian government decided to correct the market failure through subsidies granted by FITEL.

The FITEL's RPT projects had mixed outcomes. While some projects were very good if evaluated by certain criteria (for example, the increased number of customers served by the public telephones or the reduction in the community members' transaction costs related to communicating with family members), others were really bad (for example, some communities presented no generated traffic for weeks, making the private company's venture unprofitable and, therefore, increasing the likelihood that the private sector would leave and not serve the community as soon as his contract with FITEL ended). Furthermore, by disaggregating all RPT projects and not considering them as one homogenous whole, we are able to account for the variance that was present in the outcomes and implementations of the rural phones in individual communities.

Essential to the good performance of the projects was the participation of the community's local administrator, whose role was underestimated at the design phase of the projects by the decision makers in Lima. The decision-makers' urban mindset and the subsequent project design accounted for many of the problems, such as the complications of installing a public phone in a private space or not accounting for the problems that came with the private company's use of pre-paid public telephones. Since the RPT projects were carried out in a top-down approach, although some participation was included at the beginning, there was little

contextualization and adaptation to the rural realities. An example of this was that the technological solution – the rural public telephones - was put in place with little regard for cultural, language, and educational considerations and without any proper training of the targeted population. Many of the people that were benefited by FITELE did not know how to read and reading the instructions on the back of the phone card was a huge obstacle to them.

FITELE not only encountered obstacles and problems from outside the government. FITELE also received pressure by other state agencies and, in the end, was absorbed by another government institution after spending several years battling it.

Problems that are now identified and criticized in hindsight were unintended and unforeseen by several actors who had incentives to find the most optimal solution. The design of the RPT projects, in part due to them being the first set of FITELE projects, were victim of inexperience and a lack of capacity to foresee these problems but not due to a lack of capacity by FITELE's employees.

Along the years, FITELE has made many mistakes such as designing their RPT projects with little or no consideration of rural realities, not establishing in the contract the community's training as an obligation for the private company, and most importantly underestimating the role of, to my opinion, the most important actor in the RPT model: the local administrator. Despite its mistakes, FITELE has learned from them and has incorporated into its recent projects elements that would eliminate or at least mitigate the problems preset in the RPT projects. This is an interesting case of institutional learning that was driven by the mistakes that caused FITELE much criticism from inside the government and a lower level of phone use by the local community members.

Regardless of FITELE's mistakes and the problems it faced, trying to address and solve

many of the RPT problems would have created new problems or made the RPT projects unfeasible due to prohibiting costs. An example of this is the problem of using pre-paid phones vs. using coin slot phones. Choosing coin slot phones would have been more appropriate given the rural communities' economies and their preferences, but would have made the effort way too costly, probably halting the projects. Incorporating training programs into the contracts might have been a disincentive to the private companies since they argued that education was not a part of their core business and should have been assigned to another agent specialized in rural training and education.

Additionally, many of the RPT problems spurred positive consequences. For example, the fierce competition between FITELE and the MTC caused FITELE to perform better and to work harder in order to have its RPT projects approved. The organizational change experienced by FITELE also brought advantages. Having to pass its RPT projects through the SNIP, FITELE was forced to increase the rigorousness of its projects, and to focus on projects that would maximize the social benefits.

Institutional learning was probably one of the most important outcomes of the FITELE problems. This institutional learning has enabled current FITELE projects to increase participation, provide training to the community, establish guidelines for the selection of the local administrators, and ensure contextualization of both the technology and the way how the public telephone was managed.

Although the FITELE model has been highly criticized, it has been sold as a success story and reproduced in many countries such as Colombia, Brazil, Mexico, Ecuador, Paraguay, Venezuela, El Salvador, Nicaragua, many African countries, and many other countries in the world. Most criticism has come from both governmental and non-governmental Peruvian

agencies that denounced that the FTEL's projects did not use the most appropriate technology and that the community members experienced many problems, which did not allow them to experience all the benefits that having a telephone service entails.

Even though there might have been a better alternative for providing public telephone services to rural communities that were being ignored by the private sector, FTEL has been a key factor in Peru's increased telephone services. As a results of it's RPT projects, the average distance traveled by a rural community member from the targeted communities has decreased from 49 Km to 6 Km. Nearly 6,000,000 people in more than 6,000 communities benefited from the more than US\$52,000,000 that FTEL invested by placing a public phone in rural communities. With the help of projects mentioned in this thesis, families are obtaining health services, accessing markets, and fostering social relationships. Most important, I found that rural projects, if designed correctly or if adjusted once problems are identified, can bring great benefits to those their beneficiaries.

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